

Application No. 10/064,756
Attorney Docket No. 125691-2 (13591US02)

REMARKS

The present application includes claims 1-33. Claims 1-33 were rejected by the Examiner. By this Amendment, claims 1, 14, and 25 have been amended.

Claims 1-33 were rejected under 35 U.S.C. §102(b) as being anticipated by Toki et al., U.S. Patent No. 5,594,772.

Claims 1-33 were rejected under 35 U.S.C. §103(a) as being unpatentable over Heuscher et al., U.S. Patent No. 6,510,337, in view of Sheehan et al., U.S. Patent No. 5,601,084.

The Applicant now turns to the rejection of claims 1-33 under 35 U.S.C. §102(b) as being anticipated by Toki et al., U.S. Patent No. 5,594,772.

Toki relates to a computer tomography apparatus. More particularly, Toki relates to a method for "acquisition of tomographic image data corresponding to a specific heartbeat phase or respiration phase" (col. 14, lines 44-47).

Toki describes selecting a single trigger point, not multiple trigger arrays. More particularly, Toki describes selecting a threshold value or specific amplitude of a heartbeat or respiration waveform signal with an input means, such as a push-button switch, joystick, or mouse (col. 14, lines 48-62). The threshold value is set based on a desired heartbeat or respiration phase (col. 15, lines 39-49). Alternatively, the threshold value may be set based on a desired tomographic image, which is then linked to a

Application No. 10/064,756
Attorney Docket No. 125691-2 (13591US02)

corresponding heartbeat or respiration waveform signal for future scans (col. 15, lines 13-38).

Additionally, Toki describes initiating multiple CT scans based on a single fixed trigger point, not multiple independently configurable trigger arrays. In reference to Figure 14 of Toki, "[t]he synchronization controller 73 compares the heartbeat waveform signal or respiration waveform signal with the threshold value signal from the threshold value setting unit 74, and outputs a synchronization signal to the scan controller 70 at each timing at which the amplitude of the signal has reached the threshold value" (col. 15, lines 60-65). More particularly, in reference to Figures 15A and 15B of Toki, "[t]he scan controller 70 starts the X-ray radiation and data acquisition at reception timings t1, t2, .. of the synchronization signal" (col. 15, lines 65-67).

Consequently, Toki does not teach or disclose multiple independently configurable trigger arrays. Rather, Toki triggers at the same trigger point in a heartbeat or respiration waveform over multiple CT scans.

Claims 1, 14, and 25 recite selecting multiple independently configurable trigger arrays. Additionally, based on the interview with the Examiner on April 18, 2005, claims 1, 14, and 25 have been amended to recite that each trigger array includes a plurality of trigger points. Claims 1, 14, and 25 have also been amended to recite that each CT scan is initiated based on a trigger array.

Application No. 10/064,756
Attorney Docket No. 125691-2 (13591US02)

Therefore, the Applicant respectfully submits that independent claims 1, 14, and 25 and corresponding dependent claims 2-13, 15-24, and 26-33 are in condition for allowance.

The Applicant now turns to the rejection of claims 1-33 under 35 U.S.C. §103(a) as being unpatentable over Heuscher et al., U.S. Patent No. 6,510,337, in view of Sheehan et al., U.S. Patent No. 5,601,084.

Heuscher relates to a multi-phase cardiac imager. More particularly, Heuscher relates to a method of cardiac gating for locating a selected cardiac phase within the cardiac cycle (col. 2, lines 2-11).

Like Toki, Heuscher also describes selecting a single trigger point, not multiple trigger arrays. Heuscher describes selecting a desired cardiac phase of interest (col. 2, line 2-11), or trigger point. More particularly, after the trigger point, or desired phase of the heart to be located and/or imaged, is "selected, a delay D is calculated for the corresponding cardiac phase based on the instantaneous heart cycle time and the compliance" (col. 6, lines 36-49). In reference to Figure 1 of Heuscher, "the scan controller 90 triggers operation of the scanner 10 after a delay period D following each R-wave peak such that image data corresponding to a specific to the cardiac cycle of interest is generated by the CT scanner 10 and acquired from the detectors 40" (col. 8, lines 62-66). "For example, if the aim is to acquire images during the end-diastolic

Application No. 10/064,756
Attorney Docket No. 125691-2 (13591US02)

phase, the [delay] can be calculated and used as input to then generate a trigger at the appropriate time based on the current heart rate" (col. 8, lines 4-7).

Additionally, Heuscher describes initiating multiple CT scans based on a single fixed trigger point, not multiple independently configurable trigger arrays. Heuscher does not teach or disclose a fixed delay for identifying when the heart is at a given phase in the cardiac cycle (col. 1, lines 41-46). Rather, Heuscher describes a variable delay. More particularly, "[f]rom cycle to cycle, each calculated D can then be used to accurately and consistently identify, locate and/or image the cardiac phase to which it corresponds" (col. 6, lines 46-49). However, as described above, the selected trigger point, or desired cardiac phase of interest, is distinct from the delay and remains fixed between cardiac cycles (col. 2, lines 2-11). More particularly, Heuscher provides that "consistent identification and imaging of the same desired heart phase from cycle to cycle in a patient" is particularly advantageous (col. 2, lines 31-34).

Consequently, Heuscher does not teach or disclose multiple independently configurable trigger arrays. Rather, Heuscher triggers at the same trigger point in a cardiac cycle over multiple CT scans.

Additionally, Sheehan does not overcome the shortcomings of Heuscher, as described above. For example, Sheehan does not teach or disclose multiple independently configurable trigger arrays.

Claims 1, 14, and 25 recite selecting multiple independently configurable trigger arrays. Additionally, based on the interview with the Examiner on April 18, 2005, claims

Application No. 10/064,756
Attorney Docket No. 125691-2 (13591US02)

1, 14, and 25 have been amended to recite that each trigger array include a plurality of trigger points. Claims 1, 14, and 25 have also been amended to recite that each CT scan be initiated based on a trigger array.

Therefore, the Applicant respectfully submits that amended independent claims 1, 14, and 25 and corresponding dependent claims 2-13, 15-24, and 26-33 are now in condition for allowance.

By this Response, claims 1, 14, and 25 have been amended to correct a clerical error. More particularly, with regard to claims 1, 14, and 25, rather than showing a deletion, the language "along said cardiac cycle" was unintentionally omitted in the prior Amendment, dated February 24, 2005. By this Response, the prior deletion of language from claims 1, 14, and 25 is properly reflected in the claims. No new matter was added, nor was the scope of the claims changed by this amendment. Therefore, the Applicant respectfully submits that claims 1, 14, and 25 are in condition for allowance.

Application No. 10/064,756
Attorney Docket No. 125691-2 (13591US02)

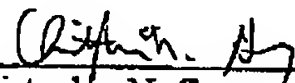
CONCLUSION

If the Examiner has any questions or the Applicant can be of any assistance, the Examiner is invited and encouraged to contact the Applicant at the number below.

The Commissioner is authorized to charge any necessary fees or credit any overpayment to the Deposit Account of GTC, Account No. 070845.

Respectfully submitted,

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